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From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

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PCT

To:

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NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL PRELIMINARY
EXAMINATION REPORT

(PCT Rule 71.1)

Date of mailing
(day/month/year)

11.06.2004

Applicant's or agent's file reference
103961 PJ/HA

IMPORTANT NOTIFICATION

International application No.
PCT/FI 03/00159

International filing date (day/month/year)
04.03.2003

Priority date (day/month/year)
05.03.2002

Applicant

TARTUNTAMARKKINOINTI OY et al.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.
4. **REMINDER**

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

The applicant's attention is drawn to Article 33(5), which provides that the criteria of novelty, inventive step and industrial applicability described in Article 33(2) to (4) merely serve the purposes of international preliminary examination and that "any Contracting State may apply additional or different criteria for the purposes of deciding whether, in that State, the claimed inventions is patentable or not" (see also Article 27(5)). Such additional criteria may relate, for example, to exemptions from patentability, requirements for enabling disclosure, clarity and support for the claims.

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PCT 10/506566

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

REC'D 15 JUN 2004

WIPO PCT



Applicant's or agent's file reference 103961 PJ/HA	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)	
International application No. PCT/FI 03/00159	International filing date (day/month/year) 04.03.2003	Priority date (day/month/year) 05.03.2002
International Patent Classification (IPC) or both national classification and IPC E04H12/22		
Applicant TARTUNTAMARKKINOINTI OY et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 6 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

 These annexes consist of a total of 6 sheets.

3. This report contains indications relating to the following items:
- I ☒ Basis of the opinion
 - II ☐ Priority
 - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - IV ☐ Lack of unity of invention
 - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - VI ☐ Certain documents cited
 - VII ☐ Certain defects in the international application
 - VIII ☐ Certain observations on the international application

Date of submission of the demand 06.10.2003	Date of completion of this report 11.06.2004
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Flores Hokkanen, P Telephone No. +49 89 2399-2525 

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/FI 03/00159

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1, 2 as published
3-6 filed with telefax on 12.03.2004

Claims, Numbers

1-7 filed with telefax on 12.03.2004

Drawings, Sheets

1/1 as published

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
☐ the language of publication of the international application (under Rule 48.3(b)).
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority in written form.
☐ furnished subsequently to this Authority in computer readable form.
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

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5. ☒ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

see separate sheet

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	4-7
	No: Claims	1-3
Inventive step (IS)	Yes: Claims	
	No: Claims	4-7
Industrial applicability (IA)	Yes: Claims	1-7
	No: Claims	

2. Citations and explanations

see separate sheet

Re Item I

Basis of the report

1. The new claim 1 includes features from original claims 1 and 6 and a passage from the description page 5, lines 17-20.

A feature present in original claim 1, where in the claimed spot footing the anchor bars are "specifically so disposed in the top plate that the anchor bars are located substantially around the hole of the base plate" has however been deleted.

This deleted feature forms part of the new claim 6.

2. According to the original description in page 3, lines 31-36, the claimed product is based on the solution that the bars are so disposed that the main reinforcement of the column where the spot footing is to be used, can be placed as close as possible to the centre line formed by a given bolt which passes through the bolt hole of the spot footing. Accordingly, the original claim is defined with a feature that the bars are located around the said bolt hole on the base plate.
3. In the new claim 1, however, the location of the bars relative to the hole in the base plate is left open. In consequence, the bars may have any position as long as they are fixed on the top plate, also; for example, over the bolt hole of the base plate, which would not allow the column reinforcement to be placed relative to the bolt according to the solution.
4. In consequence, the deleted feature is presented as essential in the disclosure of the invention and is also indispensable as such for the function of the invention in the light of the technical problem which it seeks to solve.
5. The deletion of the feature introduces therefore subject-matter which extends beyond the content of the application as filed, contrary to Article 34(2)(b) PCT.
6. In view of this observation, the amended set of claims will not be considered for examination. The present preliminary report is therefore based in the set of claims 1 to 7 as originally filed.

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EXAMINATION REPORT - SEPARATE SHEET**

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Re Item V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Reference is made to the following documents:

D1: EP-A2-0952265

D2: FI-B-95164

2. Document D1 is regarded as being the closest prior art to the subject-matter of independent claim 1, and discloses (see column 3, lines 6-54 and in particular fig. 2):

Spot footing 1 ('Stützenschuh') comprising a base plate 10 provided with a mounting hole 50, and a substantially cylindrical, rigid protective casing 20 consisting on a top plate 25 and a side wall part 21,22 having an opening, an anchor bar 31 being secured to said top plate, wherein the spot footing comprises two or more anchor bars 31,32 (two are disclosed) secured to the top plate 25 specifically so disposed in the top plate that the anchor bars are located substantially around the hole 50 of the base plate (see fig. 1 and 2).

The subject-matter of independent claim 1 is therefore not new (Article 33(2) PCT).

3. This also considers the following:

- The casing in D1 is considered as being "substantially" cylindrical, as much as this term is understood.
- The spot footing disclosed in D1 is considered as being suited for securing a precast concrete column to a foundation (see for example column 1, lines 3-8).

4. Moreover, the subject-matter of claim 1 is also not new against D2 (fig. 1,2), disclosing a spot footing ('pilarikenkä') comprising a base plate 2, mounting hole 11, substantially cylindrical casing 1 with top plate 3 and side wall parts 12,13 having an opening, two anchor bars 4 secured to the top plate located substantially around the hole of the base plate (fig. 2).

5. Dependent claims 2 to 7 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in

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respect of novelty or inventive step, the reasons being as follows:

- Regarding claim 2, in D1 the anchor bar 60 is secured to the back side of the side wall on an axis of symmetry.
- Regarding claim 3, in D1, considering the shape of the wall parts, the centre of gravity is going to be well located inside the hole 50 of the base plate. This can also be mentioned for D2 (fig. 2).
- Regarding claims 4 and 5, to provide an elliptical hole instead of circular as in D1 or to provide a further hole for prestressing cables to pass through it is considered a minor constructional change, obvious for the skilled person.
- Regarding claims 6 and 7, the top plate 25 in D1 is a protective casing part, as it is intended to hinder poured concrete to enter into the casing during casting (see col. 3, lines 25-32). To make one part thinner or thicker according to, for example, the load distribution, is considered as obvious for the skilled person.

CLAIMS

1. Spot footing designed especially for securing a precast concrete or timber column to a foundation and/or for extending such a column, said spot footing comprising a base plate (3) provided with a mounting hole (7), and a cylindrical protective casing consisting of a top plate (2), a side wall part (4, 6) having an opening (5) and anchor bars, **characterized** in that the spot footing comprises two or more anchor bars (1) secured to the top plate (2) so that the loads are transmitted via anchor bars (1), the top plate (2), the wall part (4,6) and the base plate (3), and the top plate consists of a thicker force-transmitting part (2') and a thin protective casing part (2''), which is fittable against the column mold.
2. Spot footing according to claim 1, **characterized** in that one or more vertical anchor bars (8) are secured, e.g. by welding, to the back side of the side wall part (4) substantially on an axis of symmetry.
3. Spot footing according to claim 1, **characterized** in that the side walls (4, 6) of the protective casing are so shaped that, in respect of material strength, the center of gravity of the cross-section of the wall is located substantially at the center of the bolt hole (7).
4. Spot footing according to claim 1, **characterized** in that the hole (7) of the base plate (3) is elliptical.
5. Spot footing according to claim 1, **characterized** in that the top plate (2) of the protective casing is provided with a round hole (9) located in alignment with the hole in the base plate (3), allowing the use of prestressing cables.
6. Spot footing according to claim 1, **characterized** in that the anchor bars are so disposed in the top plate that the anchor bars are located substantially around the hole (7) of the base plate (3).
7. Spot footing according to claim 1, **characterized** in that the top plate (2) consists of two parts (2', 2'') of different thicknesses, either so that the top plate (2) edge (2'') fitted against the column mold is made of thinner material than part

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(2'), or so that the thinner part is secured to the frontal surface of the thicker part.

Empfangszeit 12. März 13:33

AMENDED SHEET

ing anchorages and, to achieve a lighter spot footing structure, a rigid angle iron structure secured to the base plate so that the planes of its legs are perpendicular to the base plate. The angle iron structure has been fitted to direct the balancing forces transversely relative to the forces generated by the bolt fitted in the bolt hole and the main anchor bars so that the balancing forces will not increase the required capacity of the main anchor bars. The main anchor bars can be secured to the inner or outer surface of the angle iron structure or to a separate rigid plate transverse to the angle iron structure, which plate may be similar to the base plate and which can be welded to the upper edge of the angle iron structure so that it extends above the protective casing. In respect of material strength, the function of the spot footing is based on the base plate and the angle iron welded on it, to which the anchor bars are welded. In addition, as parts of the footing, the molding boxes in the top and in the side of the angle iron have no function in respect of material strength. Moreover, the footing comprises balancing parts. A drawback with the spot footing according to specification DE-A1-195 14 685 is that the center of gravity of the angle iron lies far from the bolt hole, and the center of gravity of the anchor bars, being welded to the angle iron, is also far from the bolt hole. The internal eccentricity forces in the footing grow large and separate balancing parts are needed. The top plate has no function in respect of material strength, it is only a concrete casting shield. EP-A2-0952265 and FI-B-95164 disclose a spot footing comprising a base plate provided with a mounting hole, and a protective casing consisting of a top plate, a side wall part and anchor bars. The anchor bars are secured to the side wall part. A drawback with the spot footing according to these publications is that the center of gravity of the side walls lies far from the bolt hole, and the center of gravity of the anchor bars, being welded to the side walls, is also far from the bolt hole. The internal eccentricity forces in the footing grow large and separate balancing parts may be needed. The top plate has no function in respect of material strength, it is only a concrete casting shield.

In the solution disclosed in the present invention, the prior-art solution used in the above-mentioned specification EP-A2-0900898 is partly made use of as regards the compact casing structure. The structure of the spot footing of the invention allows serial production that is more comprehensively economical in view of the processing costs and column reinforcement costs when long columns extending through several floors are to be manufactured or when a column structure is to be prestressed.

The present invention is based on a solution where two or more anchor bars are secured to the top of the spot footing, the bars being so disposed that the main reinforcement of the column can be placed as close to the center line formed by the bolt as possible. In the reinforcing cage, the main reinforcement is thus at the corner of the hook. By using several bars, the number of anchor bars can be more easily adapted so that it corresponds to the bolt force. If the column is produced by prestressing, then the top of the casing can be provided with a hole, through which the cable is threaded through the hole in the base plate to the prestressing bed. When the casting mold is dismantled, the cable is cut below the top of the casing. The hole in the base plate can be made elliptical, thus allowing the spot footing to be used with different protective concrete layers on the bolts. Therefore, production can be implemented in longer series, more efficient production can be achieved and the storability can be improved. To allow greater mounting tolerances, the bolt hole is always made larger than the bolt diameter. By using an elliptical hole, the mounting tolerance is increased. The slight eccentricity between the anchor bars and the bolt is dealt with simply by adding one or more anchor bars to the back wall of the casing. As a result, the anchor bars on the top and behind the casing form a force couple balancing the eccentricity. In the finished structure, the steel parts of the spot footing have to be protected against fire because, when the temperature rises, the yield strength and load-bearing capacity of the steel are reduced. Load-bearing steel parts are generally placed inside second-stage concrete. In an embodiment of the invention, the part of the top of the nut casing in the area of the opening of the casing is made from thin sheet, which is so shaped that it centers the part into alignment with itself and seals the structure so that no concrete can flow into the casing. In the finished structure, the concrete constitutes a fire shield for the thick structural casing top part, so the spot footing need not be entirely embedded in the floor concrete.

In the solution of the present invention, the casing is so shaped that, in respect of material strength, its center of gravity is located at the center of the bolt hole. The anchor bars are secured to the top plate, which, in respect of material strength, functions as a force-transmitting part and simultaneously as a casting shield. The center of gravity is as close to the center of the bolt hole and also to the main bar of the column corner as possible, which is why an anchor bar is needed to eliminate this slight eccentricity. In this solution, the internal eccen-

tricity forces in the footing are minimized by a casing design and disposition of anchor bars correct in respect of material strength and by securing the anchor bars to the casing top instead of to the wall.

- 5 The features of the solution of the invention are presented in detail in the claims below.

In the following, the invention will be described in detail by the aid of an example with reference to the attached drawing, wherein

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Fig. 1 presents a spot footing according to the invention in side view,

Fig. 2 presents the spot footing of the invention in top view,

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Fig. 3 presents an embodiment of the spot footing of the invention in top view,

Fig. 4 presents the spot footing of the invention in side view as seen from the direction of the opening of the casing, and

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Fig. 5 presents the spot footing of the invention in top view and sectioned through the casing.

Fig. 1 - 5 present a spot footing according to the invention, comprising a rigid nut casing having a base plate 3, a top plate 2' and a wall part 4, all made of sufficiently thick iron plate, so that the loads are transmitted via anchor bars and the top, wall part and bottom of the nut casing to the foundation.

Parts 1 shown in Fig. 1 and 4 are anchor bars of the footing, which are secured to the top plate 2 of the footing casing either by welding or by means of screw threads. Part 1 anchors the spot footing to the reinforced concrete structure. An embodiment of the invention comprises two or more anchor bars 1 specifically so disposed that the anchor bars are positioned around the hole 9 made in the footing top plate 2 for the main reinforcement as illustrated in Fig. 3.

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The hole 9 corresponds to the center of the base plate 3, where the main reinforcement bars or prestressing bars of the column are located, so the main rein-

forcement of the concrete column can be connected onto the top plate 2 at a point corresponding to the bolt hole 7 of the base plate 3. This embodiment is used in prestressed columns, in which the tendons have to be drawn through the structure from end to end of the mold. The footing base plate 3 corresponds in shape to the cross-sectional area of the casing structure. In the area of the opening 5 of the casing, the base plate 3 is so shaped that it corresponds to the cross-section of the concrete. The footing shown in the figure is thus used at the corner of a column of beveled rectangular cross-section. In the case of a round column the base plate has a round edge, and when the spot footing is placed on the side of a rectangular column, it is straight. At the center of the base plate 3, a hole 7 is provided for the foundation anchor bolt of the lower floor. In a solution according to the invention, the bolt hole 7 has an elliptical form, allowing the same spot footing to be used in different bolt applications. Depending on the protective concrete layers required, the bolt is positioned either in the inner part of the hole 7 or at its outer edge. Part 4 forms the side wall of the protective nut casing, and it has a cylindrical structure or a polygonal structure bent into a cylindrical shape, provided with an opening 5 on one side of it to allow the nut to be mounted. The edges 6 of the opening 5 of the protective casing 4 are bent to match the base plate 3 of the casing. The shaping of the edges 6 and opening area of the base plate 3 guides the footing against the edges of the column mold. The top plate 2 consists of two parts, a structural thicker part 2', to which the anchor bars are secured; and a formed part 2" applied against the column mold. In the cast-structure, only the thin formed part 2" transfers heat to the structural part 2' in a fire situation. It is thus not necessary to cast the top part 2 of the casing inside the floor structure to provide protection against fire. The various parts of the casing structure are assembled by welding.

Welded to the back side of the side wall part 4 of the protective casing is a vertical anchor bar 8, which is placed on an axis of symmetry and which, together with anchor bars 1, forms a force couple balancing the eccentricity, and horizontal tie bars 10 on either side of the axis of symmetry.

Practical applications of the spot footing include precast concrete columns and foundation columns. From the precast concrete column, only the threaded bars protrude, and these are mounted inside the spot footing. The invention is not limited to the embodiments described above; instead, it can be varied within the scope of the following claims.